

**REMARKS**

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-3, 6-24 and 30-33 are pending, with claims 1-3, 8, 14 and 23-24 amended, claims 30-33 added, and claims 4-5 and 25-29 cancelled without prejudice or disclaimer by the present amendment. Claims 1, 8 and 23-24 are independent.

In the Official Action, claims 2-3 were objected to; claims 25, 26 and 29 were rejected under 35 U.S.C. § 102(b) as being anticipated by Srivastava (U.S. Patent No. 6,621,211); claims 1-21 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Maeda (WO 2003/032407); and claims 27-28 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Srivastava.

Claims 1-3, 8, 14 and 23-24 are amended and claims 30-33 are added to more clearly describe and distinctly claim Applicants' invention. Support for this amendment is found in Applicants' originally filed specification. No new matter is added.

In view of the cancellation of claims 25-29, the rejections of claims 25-29 are moot. Claims 2-3 are amended in response to the outstanding objection. Claims 1, 8 and 23-24 are amended to recite the features of cancelled original claim 5. Thus, the rejection of claims 1, 8 and 23-24 are moot.

Briefly recapitulating, amended claim 1 is directed to

A phosphor having the chemical formula:  $\text{Sr}_{4-x}\text{Mg}_y\text{Ba}_z\text{Si}_2\text{O}_8:\text{Eu}^{2+}_x$  ( $0 < x < 1$ ,  $0 \leq y \leq 1$ ,  $0 \leq z \leq 1$ ),

wherein when the phosphor is excited by light having a main peak ranging from 400 to 480nm, the phosphor has a main emission peak ranging from 500 to 600nm.

Claims 8 and 23-24 also recite, *inter alia*, when the phosphor is excited by light having a main peak ranging from 400 to 480nm, the phosphor has a main emission peak ranging from 500 to 600nm.

For the purposes of this response, when discussing the Maeda reference, Applicants refer to corresponding family patent publication US 2004/0245532. In U.S. 2004/0245532, Maeda describes a semiconductor light emitting device and a semiconductor light emitting apparatus for emitting white-based light with high luminous flux and a large Ra and composed of a combination of a near ultraviolet LED and a phosphor layer including a plurality of phosphors. However, none of the phosphors of Maeda are of the composition  $\text{Sr}_{4-x}\text{Mg}_y\text{Ba}_z\text{Si}_2\text{O}_8:\text{Eu}^{2+}_x$  ( $0 < x < 1$ ,  $0 \leq y \leq 1$ ,  $0 \leq z \leq 1$ ). Maeda also describes a number of background art phosphors.

In rejecting original claim 5, the Official Action refers to one of the background art descriptions of Maeda (i.e., Japanese Laid-Open Patent Publication No. 2001- 143869, which is misidentified as 2001-1438769 in paragraph [0012] of US 2004/0245532). Maeda describes that JP 2001-143869 discloses  $\text{Sr}_3\text{MgSi}_2\text{O}_8:\text{Eu}^{2+}$  as a blue phosphor (see para [0012] of US 2004/0245532). However, while the chemical formula of Applicants' claimed phosphor of  $\text{Sr}_{4-x}\text{Mg}_y\text{Ba}_z\text{Si}_2\text{O}_8:\text{Eu}^{2+}_x$  ( $0 < x < 1$ ,  $0 \leq y \leq 1$ ,  $0 \leq z \leq 1$ ) is similar with the  $\text{Sr}_3\text{MgSi}_2\text{O}_8:\text{Eu}^{2+}$  of Maeda's background art, Applicants' claimed phosphor has a different characteristic. Indeed, Applicants' claimed phosphor is green phosphor. That is, when Applicants' claimed phosphor is excited by light having a main peak ranging from 400 to 480nm, the phosphor has a main emission peak ranging from 500 to 600nm. Because the  $\text{Sr}_3\text{MgSi}_2\text{O}_8:\text{Eu}^{2+}$  of JP 2001-143869 is a blue

phosphor, the  $\text{Sr}_3\text{MgSi}_2\text{O}_8:\text{Eu}^{2+}$  of JP 2001-143869 does not have a main emission peak ranging from 500 to 600nm.

Paragraph [0011] of US 2004/0245532 describes different background art (i.e., Japanese Laid-Open Patent Publication No. 2000-509912, not JP 2001-143869). Maeda describes JP 2000-509912 as disclosing a semiconductor light emitting device composed of, *inter alia*, a blue phosphor having an emission peak in a wavelength region not less than 430 nm and not more than 490 nm, a green phosphor having an emission peak in a wavelength region not less than 520 nm and not more than 570 nm, and a red phosphor having an emission peak in a wavelength region not less than 590 nm and not more than 630 nm. In this semiconductor light emitting device,  $\text{BaMgAl}_{10}\text{O}_{17}:\text{Eu}$ ,  $\text{Sr}_5(\text{PO}_4)_3\text{Cl}:\text{Eu}$  or  $\text{ZnS}:\text{Ag}$  (both having an emission peak wavelength of 450 nm) is used as the blue phosphor,  $\text{ZnS}:\text{Cu}$  (having an emission peak wavelength of 550 nm) or  $\text{BaMgAl}_{10}\text{O}_{17}:\text{Eu,Mn}$  (having an emission peak wavelength of 515 nm) is used as the green phosphor, and  $\text{Y}_2\text{O}_2\text{S}:\text{Eu}^{3+}$  (having an emission peak wavelength of 628 nm),  $\text{YVO}_4:\text{Eu}^{3+}$  (having an emission peak wavelength of 620 nm),  $\text{Y(V, P, B)O}_4:\text{Eu}^{3+}$  (having an emission peak wavelength of 615 nm),  $\text{YNbO}_4:\text{Eu}^{3+}$  (having an emission peak wavelength of 615 nm),  $\text{YTaO}_4:\text{Eu}^{3+}$  (having an emission peak wavelength of 615 nm), or  $[\text{Eu}(\text{acac})_3(\text{phen})]$  (having an emission peak wavelength of 611 nm) is used as the red phosphor. However, Maeda does not describe JP 2000-509912 as disclosing  $\text{Sr}_{4-x}\text{Mg}_y\text{Ba}_z\text{Si}_2\text{O}_8:\text{Eu}^{2+}_x$  ( $0 < x < 1$ ,  $0 \leq y \leq 1$ ,  $0 \leq z \leq 1$ ), wherein when the phosphor is excited by the light having a main peak ranging from 400 to 480nm, the phosphor has a main emission peak ranging from 500 to 600nm.

Paragraphs [0017-0018] of US 2004/0245532 discuss silicate phosphors described in JP 2001-143869. However the silicate phosphors do not have the same chemical formula as recited

in Applicants' independent claims. As Maeda fails to disclose or suggest at least the above-noted features of independent claims 1, 8 and 23-24, Applicants submit the inventions defined by claims 1, 8 and 23-24, and all claims depending therefrom, are not rendered obvious by Maeda for at least the reasons stated above.<sup>1</sup>

Additionally, Maeda fails to disclose or suggest the features of new dependent claims 30-33. Thus, for independent reasons, claims 30-33 patentably define over Maeda.

### **CONCLUSION**

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Michael Monaco, Reg. No. 52,041, at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

---

<sup>1</sup> MPEP § 2142 "...the prior art reference (or references when combined) must teach or suggest **all** the claim limitations.

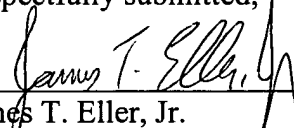
Application No. 10/578,140  
Amendment dated October 17, 2008  
Reply to Office Action of June 17, 2008

Docket No.: 3449-0620PUS1

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§ 1.16 or 1.14; particularly, extension of time fees.

Dated: October 17, 2008

Respectfully submitted,

By   
James T. Eller, Jr.

Registration No.: 39,538

BIRCH, STEWART, KOLASCH & BIRCH, LLP

8110 Gatehouse Road

Suite 100 East

P.O. Box 747

Falls Church, Virginia 22040-0747

(703) 205-8000

Attorney for Applicant